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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/624,038 | 07/21/2003 | Young-Kai Chen | 28-19-3-3 | 6373 |
| 7590 | 04/14/2006 | | | EXAMINER |
| Docket Administrator (Room 3J-219) Lucent Technologies Inc. 101 Crawfords Corner Road Holmdel, NJ 07733-3030 | | | WILSON, ALLAN R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2815 | |

DATE MAILED: 04/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------------------|-------------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/624,038 | CHEN ET AL. |
| | Examiner Allan R. Wilson | Art Unit 2815 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 27 February 2006.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 8 and 10-28 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 8 and 10-28 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 8, 10-15 and 21-26 are rejected under 35 USC § 102(b) as being anticipated by U.S. Patent No. 4,962,053 to Imai.

Regarding claims 8 and 22, Imai illustrates in figures 1(A)-4 (entire document), particularly figure 1(H), a substrate 10 having a top surface; collector 12/14, base 30a/32/36, and emitter 38/40 semiconductor layers of a bipolar transistor, the semiconductor layers forming a vertical sequence on the substrate in which intrinsic portions of two of the layers are sandwiched between the top surface of the substrate and a remaining top one of the layers,

the base layer comprising an extrinsic portion 32 that laterally encircles a vertical portion of the top one of said semiconductor layers 38; and

a dielectric sidewall 34 being interposed between the vertical portion of the top one 38 of the layers and the extrinsic portion of the base layer 32 and

wherein the dielectric sidewall has a thickness of 50-150 nm (500-1500 angstroms, col. 3, lines 54-59).

Regarding claims 10, 14 and 23, Imai illustrates in fig. 1(H) that the extension of the base layer 32 extends farther away from the substrate 10 than an interface between the top layer 38 and the base layer 36.

Regarding claims 11, 15 and 24, Imai illustrates in fig. 1(H) that one of the two layers 12 that is sandwiched between the substrate 10 and the top layer 38 may include doped region formed in the substrate 10.

Regarding claims 12 and 21, Imai illustrates in fig. 1(H) the part of the extension of the base layer 32 is located between the substrate 10 and the top layer extension 40.

Regarding claims 13 and 25, Imai illustrates in fig. 1(H) comprising a dielectric layer 34, a portion of the dielectric layer being located on the extrinsic portion of the base layer 32 and the extrinsic portion of the top one 40 of the semiconductor layers being located on the dielectric layer.

With regards to claims 16 and 26, Imai discloses in col. 4, lines 14-16, the top one 38 of the collector, base, and emitter semiconductor layers is epitaxially grown.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17 and 27 are rejected under 35 USC § 103 (a) as being unpatentable over Imai as applied to claim 8 above, and further in view of U.S. Patent No. 5,444,003 to Wang et al. (“Wang”).

With regards to claims 17 and 27, Imai is discussed above, it does not show the top one of the semiconductor layers, the emitter, is a graded layer. Wang illustrates in figures 3A and 3B and discloses in col. 7, lines 36-62, the top one of the semiconductor layers, the emitter 22, is a graded layer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a graded emitter layer for a “top-down” process that is highly compatible (Wang col. 3, lines 24-32).

Claims 18, 19, 20 and 28 are rejected under 35 USC § 103 (a) as being unpatentable over Imai as applied to claim 8 above, and further in view of U.S. Patent No. 6,541,346 to Malik. Imai is discussed above, it does not show the top one of the semiconductor layers, the emitter, is gallium or indium. Malik illustrates in figures 8 and 9 and discloses in col. 2, lines 23-31, the top one of the semiconductor layers, the emitter 51, is aluminum-gallium-arsenide or aluminum-indium-arsenide. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a top gallium or indium emitter layer to reduce the injection of majority carriers from base to emitter (Malik col. 2, lines 31-34).

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Response to Arguments

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Freeman et al. illustrates a structure similar to the one claimed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 2815

Any inquiry concerning this communication or earlier communications from an examiner should be directed to Primary Examiner Allan Wilson whose telephone number is (571) 272-1738. Examiner Wilson can normally be reached 6:00-4:30 Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allan R. Wilson
Primary Examiner
April 5, 2006